

What is claimed is:

1. An as-grown single crystal of alkaline earth metal fluoride produced by a single crystal pulling method and having a straight barrel part diameter of not  
5 less than 17 cm and a light transmittance, as measured at a wavelength of 632.8 nm, of not less than 80%.

2. The as-grown single crystal of alkaline earth metal fluoride as claimed in claim 1, wherein the main  
10 crystal growth plane is the {111}plane.

3. The as-grown single crystal of alkaline earth metal fluoride as claimed in claim 1, wherein the main crystal growth plane is the {100}plane.  
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4. The as-grown single crystal of alkaline earth metal fluoride as claimed in any one of claims 1 to 3, wherein the straight barrel part has a length of not less than 5 cm.  
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5. The as-grown single crystal of alkaline earth metal fluoride as claimed in any one of claims 1 to 4, wherein the alkaline earth metal fluoride is calcium fluoride.

6. The as-grown single crystal of alkaline earth metal fluoride as claimed in any one of claims 1 to 4, wherein the alkaline earth metal fluoride is barium  
5 fluoride.